



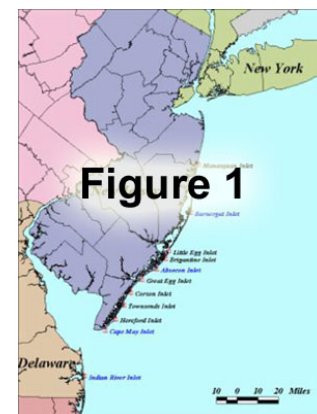
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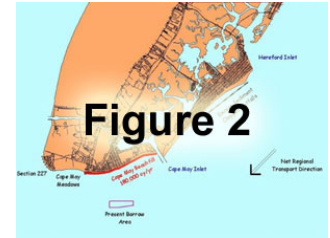
Philadelphia District: Cape May County, New Jersey

ISSUE

The Atlantic coast of New Jersey extends from Sandy Hook to Cape May, covering a range of approximately 130 miles (Figure 1). There are 11 tidal inlets along the New Jersey coast. Five tidal inlets, Shark River, Manasquan, Barnegat, Absecon, and Cape May, have Federally authorized projects (one within New York District and four within Philadelphia District). Present dredging requirements for the authorized inlets are minimal. The largest, Barnegat Inlet, is dredged at a rate of approximately 200,000 cu yd annually. Net longshore transport is generally northward north of Barnegat Inlet and southward south of Barnegat Inlet, with localized reversals adjacent to the inlets. Federally authorized beachfill projects were constructed along the New Jersey coast (one within New York District and three within Philadelphia District). An additional seven oceanfront beachfill projects are scheduled for construction in the next 5 years. Approximately 195 million cu yd of material will be placed during the 50-year project lifecycles. Available borrow material estimates are roughly equal to material requirements, with great uncertainty



in both volume and sediment quality estimates. Borrow area locations range from adjacent inlet channels and ebb shoals to nearshore and offshore features. In addition, the coastal region in the vicinity of Cape May Inlet includes a Federally authorized and constructed beachfill project in Cape May City, a beachfill project in Cape May Meadows and Cape May Point scheduled for construction in FY04, and a Section 227 demonstration project that was constructed in September 2002 (Figure 2).



RSM DEMONSTRATION PROJECT GOALS

The primary goals of this RSM demonstration project are identification and documentation of an environmentally, economically, and technically feasible method of borrowing sand from Wildwood beaches for use in the next (FY05) nourishment cycle of the Cape May City Federal beach fill project. The plan will be coordinated with environmental agencies and project partners. General design of the proposed borrow operation will be completed and documented. Final plans and specifications and environmental permitting should be completed in FY04. Implementation of the project will be scheduled in early FY05 (Sep-Oct 2004), in conjunction with the next Cape May nourishment cycle.

SUMMARY

Cape May Nourishment Project

The following RSM demonstration initiatives were identified:

Beaches immediately east and west of Cape May Inlet experience problems related to an excess and a deficit of sediment supply, respectively. The principal cause of this excess/deficit relationship is the presence of the Cape May Inlet jetties (completed in 1911) within the context of a predominant regional net southwestward sediment transport regime (Figure 3). A Federal beach erosion control project was initiated in 1990 for the U.S. Coast Guard Base and the City of Cape May, immediately west of Cape May Inlet. Sand for construction and subsequent nourishment of this project has been obtained from an offshore borrow site, but that site has an insufficient reserve of material for future nourishment needs. The District is investigating alternative sources for the approximate 200,000 cu yd/year demand at Cape May City and the Coast Guard base.



Sand Surplus on Wildwood Beaches

Contrasting the erosion on the downdrift (southwest) side of Cape May Inlet is the accumulation of sediment on the updrift beaches of Wildwood Crest and Wildwood City. The excess of sediment supply there has resulted in at least two problems: storm water outfalls that do not drain because of beach width accretion, and excessive beach widths that make recreational beach user access to the “shoreline” problematic.

STATUS

A coordination meeting between environmental agencies and project partners took place in April 2003. At that time the following options were presented and discussed.

Cape May Inlet Sand Bypassing

The District has evaluated a range of options for removing sediment from the updrift beaches for use in nourishing the beach downdrift of Cape May Inlet. Two essentially different concepts are being considered for remedy of the sediment excess/deficit problems on the updrift/downdrift shorelines adjacent to Cape May Inlet.

The first would involve a more-or-less continuous (low) level of sand bypassing across Cape May Inlet. A pipeline would be emplaced under Cape May Inlet from the vicinity of the east jetty fillet (the bypassing sand source and bypassing pump location) to a discharge point at the Coast Guard base on the west side of the inlet. Direct, mechanical removal of sand, presumably by mobile “pan scrapers,” would be employed along the beaches of Wildwood and Wildwood Crest, with stockpiling of sand at the east Cape May Inlet jetty. This would allow for prioritized and localized removal of sediment at approximately 20 to 25 storm water outfalls that presently cross the 5± miles of beach east of Cape May Inlet. A possible alternative to mechanical removal of sediment from the beaches of Wildwood and Wildwood Crest is a permanent installation of infrastructure necessary for hydraulic transport of sediment from the updrift beaches to the vicinity of the east

jetty at Cape May Inlet. Sand would be supplied to this hydraulic transport system by means of a mobile, self-contained 10- or 12-in. dredge deployed on a tracked or wheeled vehicle, working at locations as appropriate along the updrift beaches.

- The second approach considered for bypassing sediment across Cape May Inlet involves periodic (i.e., once per year, or less) dredging from the east jetty fillet by means of a conventional floating hydraulic pipeline dredge. In this plan, sediment would be bypassed across the inlet infrequently at large volume rates, as compared to the “continuous,” low-volume transport rate associated with the first plan (above). This alternative would still require a method of obtaining sand from the Wildwood and Wildwood Crest beaches, such as the mobile pan scraper concept. However, in this plan, sand would have to be stockpiled for periods of one or more years in the vicinity of the east jetty fillet, until the floating dredge was deployed to pump sand across Cape May Inlet.
- Benefits of either bypassing option include (a) cheaper nourishment for Cape May City, (b) reduced excess sediment at Wildwood (clogged outfalls, safety, ponding), and (c) reduced potential shortfall of present borrow site. A shoreline change analysis and sediment budget from North Wildwood to Cape May Point have been completed. Beach profile surveys for Cape May and Wildwood have been

collected, and viable options for bypass configuration have been evaluated.

Direct Borrow from Wildwood Beaches

The shoreline immediately updrift (northeast) of Cape May Inlet is managed by the U.S. Fish and Wildlife Service (USFWS). Due to USFWS concerns with a fixed sand bypassing plant at Cape May Inlet and stockpiling of sand in potential bird nesting areas, the District is evaluating a revised plan to bypass sand to the Cape May City Federal beach fill project via direct borrow from Wildwood beaches using a hydraulic dredge. Anticipated activities to further develop this alternative include environmental coordination of the revised plan; coordination with state and local partners; shoreline, beach profile, and sediment grain size data collection at Wildwood to determine quantity and quality of borrow material; analysis of coastal processes to determine the optimal borrow configuration; development of a feasible borrow method through coordination with dredging companies; general design of borrow plan; economic analysis; and project management and reporting.

Benefits of this alternative include:

- High quality beach sand as alternative to depleted offshore borrow areas
- Ample quantity (enough for 10+ nourishment cycles)
- Reduced problem of excess sand at Wildwood

Management of sand resources on a regional scale would benefit both Cape May and Wildwood communities. This alternative avoids work in USFWS area of Cape May Inlet and would use nonstandard dredging operations to mine sand from the beach.

**Direct Borrow from
Wildwood Beaches**

Other District activities that support objectives of the RSM demonstration program include: (a) use of a rapidly deployed all-terrain-vehicle for shoreline surveys, (b) development of a geographical information system database, and (c) implementation of an alternative long-term feasibility study.

LESSONS LEARNED

Coordination and partnership with state, local, and other Federal agencies are imperative for accomplishment of this RSM effort and are continuing.

KEY WORDS

Longshore transport, ebb shoal, erosion, accretion, pan scrapers

POINTS OF CONTACT

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Figure 1. Atlantic Coast of New Jersey [back to text](#)



Figure 2. Cape May Inlet and vicinity [back to text](#)

Cape May Inlet-Looking West



Figure 3. Cape May Inlet [back to text](#)